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ABSTRACT

In October 2002, the Texas Higher Education Coordinating Board adopted a preliminary analysis of the costs and benefits of reaching the first two goals of "Closing the Gaps by 2015," the state's higher education plan. Refinements to the analysis, which adjusted for inflation and made other changes, were presented in January 2003, and the updated report was approved in March 2003. Changes, taken together, increased the previous cost estimate for "Closing the Gaps," which included only marginal growth using fiscal year 2000 data for 300,000 students, from $6.3 billion to $8.4 billion. An additional $4.8 billion was associated with normal growth, bringing the total cost associated with general revenue appropriations to institutions, financial aid, and tuition and fees to $13.2 billion through 2015. An alternative analysis was also developed to provide the potential costs associated with continuing past enrollment trends, those expected if "Closing the Gaps" is not implemented. The analysis indicates that there is a net positive return associated with obtaining education beyond high school. This investment in human capital, by both the state and the student, is projected to cost an estimated $6.9 billion in new construction costs for public universities and community colleges and also to account for the cost of normal growth in enrollment and for "Closing the Gaps" growth. However, the discounted return on the investment for both normal growth and growth associated with "Closing the Gaps," with the multiplier effect included, is calculated at $325 billion. Subtracting opportunity costs produces a net benefit of $274 billion. Overall, the investment produced more than a 13-fold return and an additional $2.8 billion in discounted general revenue. (SLD)

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Cost/Benefit Analysis of *Closing the Gaps*

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Final Report
March 7, 2003

Division of Finance, Campus Planning, and Research
Texas Higher Education Coordinating Board

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Coordinating Board Mission

The mission of the Texas Higher Education Coordinating Board is to provide the Legislature advice and comprehensive planning capability for higher education, to coordinate the effective delivery of higher education, to administer efficiently assigned statewide programs, and to advance higher education for the people of Texas.

THECB Strategic Plan

Coordinating Board Philosophy

The Texas Higher Education Coordinating Board will promote access to quality higher education across the state with the conviction that access without quality is mediocrity and that quality without access is unacceptable. The Board will be open, ethical, responsive, and committed to public service. The Board will approach its work with a sense of purpose and responsibility to the people of Texas and is committed to the best use of public monies.

THECB Strategic Plan

Background

At its October 2002 meeting, the Texas Higher Education Coordinating Board (THECB) adopted a preliminary analysis of the costs and benefits of reaching the first two goals of *Closing the Gaps by 2015,* the state's higher education plan. Refinements to that analysis were presented at the January 2003 board meeting. This report was circulated to the institutions and others for review. The updated report was approved by the Committee on Administration and Financial Planning at its March meeting on behalf of the Board.

The preliminary analysis presented to the Board in October included:

- Expanded cost analysis that reports separately the following:
  - General revenue
  - Tuition and fees
  - Financial aid
- Capital expenditures
  - Public universities
  - Community colleges
- Mortality rates
- Revenue implications for the state
- Multiplier effects

The model refinements, suggested by Dr. Tamara Plaut from the Comptroller's Office, presented to the Board in January included:

- Discount increases in income
- Adjust for inflation
- Use an alternative wage index
- Adjust for employment
- Adjust for Alpha values
- Include opportunity costs

Discounting the increased income adjusts the constant (2002) income estimates for inflation (3 percent) and the projected return on investment (3 percent). The costs associated with normal and *Closing the Gaps* growth are also adjusted for inflation, albeit at a lower rate. Given the current state budget situation and the debate regarding the relative trade-off between the state's and the student's financial contribution, these inflated costs may require additional adjustment. The alternative wage index is for all workers, which is lower than the full-time, year-round worker index initially used. The adjustment for employment recognizes that not all of the students who comprise normal and *Closing the Gaps* growth are employed in any given year. Alpha values take into consideration that not all of the increased income may be attributed to obtaining higher levels of education. Opportunity costs capture the income that is lost while the student is in school and not earning a wage.

The general revenue implications were estimated by Dr. Plaut. Texas generates most of its general revenue from sales tax revenue. However, not all of the increase in income will be spent on consumption, and some of what is spent on consumption will not be taxed (food) or will be taxed at a different rate. The composite tax rate is estimated at 3.4 percent. This produces a discounted increase in general revenue of $2.8 billion.

Costs

This report describes the identifiable costs associated with enrolling an additional 500,000 students in Texas higher education – the participation goal of *Closing the Gaps*. A cost analysis is presented below in which (1) financial aid and (2) tuition and fees (i.e., the student's contribution) are presented separately from general revenue appropriated directly to higher education institutions. Table 1 shows the difference on a headcount basis and Table 2 provides an aggregated comparison. The FY 2000 costs presented in Part I have been updated with FY 2002 costs, which have also been adjusted for inflation to 2015. These changes taken together increase the previous cost estimate of *Closing the Gaps*, which included only marginal growth using FY 2000 data for 300,000 students, from $6.3 billion to $8.4 billion. An additional $4.8 billion is associated with normal growth (200,000 students), bringing the total cost associated with general revenue appropriations to institutions, financial aid, and tuition and fees to $13.2 billion through 2015.

Table 1

FY 2002 General Revenue (GR), Financial Aid, and Tuition and Fees Per Headcount

	Cost Per Headcount			
	a	b	c	a+b+c
	FY 2002 GR Cost	FY 2002 Avg. State Financial Aid	FY 2002 Tuition/Fees	FY 2002 Total Cost
Public Universities				
UG[1] General - new enrollment	$1,774	$397	$2,512	$4,683
Increased Retention (%UG[1]+%G[2])	$2,624	$397	$2,512	$5,533
Graduate Students	$5,176	$397	$2,512	$8,085
Teaching	$1,774	$397	$2,512	$4,683
Eng. and Comp. Science	$3,677	$397	$2,512	$6,586
Nursing (Includes HRIs[3])	$3,986	$397	$2,512	$6,895
Public Community Colleges				
Academic Transfer	$1,680	$73	$599	$2,352
Increased Retention	$1,680	$73	$599	$2,352
• Nursing	$1,882	$73	$599	$2,554
• Technical	$1,882	$73	$599	$2,554
• Eng. and Comp. Science	$1,882	$73	$599	$2,554
Indep. Colleges Financial Aid		$872		$ 872
Texas State Technical Colleges				
Technical	$3,946	$219	$1,609	$5,774
Eng. and Comp. Science	$3,946	$219	$1,609	$5,774

[1]undergraduate
[2]graduate
[3]health-related institution

Table 2

FY 2002 General Revenue (GR), Financial Aid, and Tuition and Fees Estimated Total Cost by 2015

	Estimated Total Cost				
	a	b	c	d	a+b+c+d
	Total GR Cost	Local Funds	Avg. State Financial Aid	Tuition/Fees	Total Cost
Public Universities[1]	$2.8 billion		$558 million	$3.6 billion	$6.958 billion
Construction Cost	$2.4 billion				$2.400 billion
Community Colleges	$4.5 billion		$186 million	$1.5 billion	$6.186 billion
Construction Cost		$4.5 billion			$4.500 billion
Totals	$9.7 billion	$4.5 billion	$744 million	$5.1 billion	$20.044 billion

The Coordinating Board staff estimated cost of construction for public universities using the Space Model for Academic Institutions. The current deficit of approximately 2 percent has been maintained throughout the forecast period. The cost of construction for public universities, for both normal and *Closing the Gaps* growth to 2015, is $2.4 billion, which represents an additional 17.4 million square feet of new construction. The total construction cost for community colleges is estimated at $4.5 billion, for an additional 36.3 million square feet of new construction. No additional construction costs have been included for the health-related institutions.

[1] For the purposes of calculating aggregate cost, independent colleges and universities have been included with public universities and technical colleges have been included with community colleges. All construction costs are considered general revenue.

Costs – Alternative Analysis

State demographer Dr. Steve H. Murdock developed an alternative analysis[2] that provides the potential costs associated with continuing past enrollment trends – that is, the expected trends if *Closing the Gaps* is not implemented.

Dr. Murdock projected educational attainment based on 1990-2000 Texas trends:

- In 2000, 18.8 percent of the state's population, 25 years and older, did not have a high school diploma. By 2040, the proportion would increase to 30.1 percent of the state population.
- In 2000, 29 percent of the population, 25 years and older, had a high school diploma. By 2040, the proportion would decrease to 28.7 percent of the state population.
- In 2000, 28.7 percent of the population, 25 years and older, had some college education. By 2040, the proportion would decrease to 23.9 percent of the state population.
- In 2000, 18.2 percent of the population, 25 years and older, had a baccalaureate degree. By 2040, the proportion would decrease to 12.9 percent of the state population.
- In 2000, 5.3 percent of the population, 25 years and older, had a graduate or professional degree. By 2040, the proportion would decrease to 4.4 percent of the state population.

These trends would reduce average annual household income by $5,087, adjusted for inflation. Also, poverty levels, participation in the Temporary Assistance for Needy Families (TANF) program, and participation in the Medicaid and food stamp programs would increase. Prison incarceration rates would also rise.

Dr. Murdock projects that the state's population would increase by 68 percent - from 20.8 million to 35 million people - from 2000 to 2040. Based on past educational attainment trends, approximately 12.4 million households would be losing $63.2 billion in 2040.

Normal growth is projected to provide 200,000 students towards the state's *Closing the Gaps* participation goal, while an additional 300,000 students would be enrolled through *Closing the Gaps* and other strategies. For this and subsequent analyses, an estimate of the costs and benefit associated with normal growth are also presented.

Each of the five higher education sectors would contribute to the *Closing the Gaps* goal:

- Public universities would account for 16.4 percent (N = 49,298) of the increase in first-year students. However, public universities would also account for an additional 51,999 students who matriculate from community colleges
- Community and state colleges would account for 69.3 percent (N = 207,996) of the increase in first-year students
- Technical colleges would account for less than 1 percent (N = 2,916) of the increase in first-year students
- Independent (non-public) colleges would account for 13.3 percent (N = 39,787) of the increase in first-year students
- Health-related institutions would account for .25 percent (N = 453) of the additional nursing student enrollment

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[2] Population Change in Texas: Implication for Human and Socioeconomic Resources for the 21st Century.

Benefits

The preliminary analysis of the success goal considered only additional "incremental annual and lifetime earnings" associated with obtaining education beyond the high school level for the 300,000 first-year students. National data from a recently published study by the U.S. Census Bureau were discounted[3] to account for the difference with Texas median household income.

The incremental annual earnings calculation is, in large part, based upon matriculation assumptions. Not included in the preliminary calculations was the rate at which students who have entered higher education through the community college system continue their education at a four-year institution and receive baccalaureate and advanced degrees. Coordinating Board staff estimate that 25 percent of community college students will transfer to a four-year institution, which represents an additional 51,999 students. As a result, costs increase because more students incur expenses and benefits increase because they graduate from baccalaureate and graduate or professional programs, resulting in higher earnings.

Income multiplier effects have been included, based on a conservative estimate of 2.5. This may warrant additional adjustment closer to 3.0, as suggested in *The Impact of the State Higher Education System on the Texas Economy*, released in December 2000 by the State Comptroller's Office. This paper also presents a convincing case for the cost effectiveness of higher education.

The discounted return on the investment for both normal growth and growth associated with *Closing the Gaps*, with the multiplier effect included, is calculated at $325 billion, of which normal growth would contribute $118 billion and *Closing the Gaps* accounts for $207 billion.

Summary

This analysis indicates that there is a net positive return associated with obtaining education beyond high school. This investment in human capital, by both the state and the student, is projected to cost an estimated $20 billion over the next 13 years. This figure includes an estimated $6.9 billion in new construction costs for public universities and community colleges and also accounts for the cost of normal growth ($4.8 billion) in enrollment, and $8.4 billion for *Closing the Gaps* growth. However, the discounted return on the investment for both normal growth and growth associated with *Closing the Gaps*, with the multiplier effect included, is calculated at $325 billion, of which normal growth would contribute $118 billion and *Closing the Gaps* accounts for $207 billion. Subtracting opportunity costs, which are estimated at $31 billion (and the $20 billion estimated cost from above), produces a net benefit of $274 billion. Overall, the investment produces more than a 13-fold return and an additional $2.8 billion in discounted general revenue.

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[3] In Federal FY 2000, U.S. median household income was $42,151 and Texas median household income was $39,837, or 94.5 percent of the national level.

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